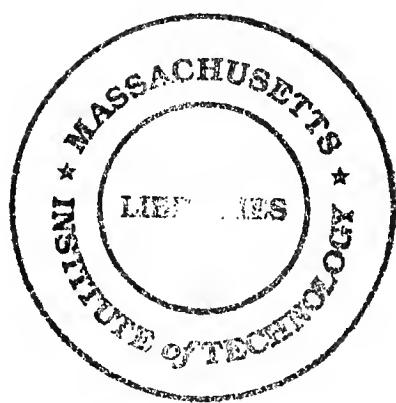


MIT LIBRARIES

3 9080 02524 4192



Digitized by the Internet Archive  
in 2011 with funding from  
Boston Library Consortium Member Libraries

<http://www.archive.org/details/mediterraneantra00temi>



Massachusetts Institute of Technology  
Department of Economics  
Working Paper Series

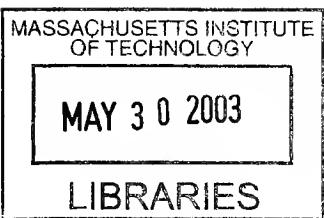
MEDITERRANEAN TRADE IN BIBLICAL TIMES

Peter Temin

Working Paper 03-12  
March 2003

Room E52-251  
50 Memorial Drive  
Cambridge, MA 02142

This paper can be downloaded without charge from the  
Social Science Research Network Paper Collection at  
<http://ssrn.com/abstract=386960>



# **Mediterranean Trade in Biblical Times**

Peter Temin

MIT

## Abstract

This paper demonstrates the presence of Heckscher-Ohlin type trade in bulk commodities in the early Iron Age. I study the trade going across the Mediterranean Sea, where costs of transport were low. I combine evidence from under-water archaeology for the existence of this trade with literary evidence about its organization. I argue that international trade was effected by market transactions well before the invention of coinage. The forces for trade analyzed by Heckscher were strong almost three millennia before he wrote, and they produced extensive trade in Biblical times.

JEL Codes: N75, F14, P52

Key Words: International Trade, Heckscher-Ohlin, Biblical Era, Ancient History, Shipwrecks

Prepared for the Celebratory Symposium to Honor Eli F. Heckscher, 1879-1952, Stockholm, Sweden, May 22-24, 2003. I thank Lawrence E. Stager for his extensive advice, encouragement and help. I thank also M. June Flanders and Elhanan Helpman for their helpful comments and suggestions. All errors of course are mine alone.



## **Mediterranean Trade in Biblical Times**

### **Introduction**

This paper analyzes trade in the Mediterranean Sea in Biblical times, revealing that the forces Heckscher identified as stimulating trade were effective even before coinage was invented. The first part of the paper describes how we have come to be aware of this trade and what this trade appears to have been like. The second part of the paper inquires into the economics of this trade, inferring economic actions and organizations from the physical evidence.

Heckscher said in his classic 1919 paper, “The prerequisites for initiating international trade may thus be summarized as different relative scarcity, that is, different relative prices of the factors of production in the exchanging countries, as well as different proportions between the factors of production in different commodities (Heckscher and Ohlin, 1991, 48).” In the modern world, we reason as Heckscher did from relative scarcities and prices to the existence of international trade. When we study the ancient world, we are at the mercy of our sources, that is, to the accidents of history by which some evidence is preserved and much is lost. We therefore have to reason in the reverse direction, from the existence of trade to relative scarcities and prices. Some of these backward inferences can be verified from the archaeological record, but typically not prices.

### **Archaeology**

Underwater archaeology until recently was confined to the exploration of shallow waters. There is no lack of ancient shipwrecks in the coastal waters of the Mediterranean, and some of them have been found and described. It seemed reasonable

to archaeologists that these ships were representative of ancient shipping, as opposed to representing what they could find. They therefore inferred that ancient shipping followed the coastline.

This view has changed in the past generation as our ability to explore the seabed has improved. The biggest single innovation was in sonar, where "Doc" Edgerton developed side-scan sonar. This new technology allowed modern investigators to find shipwrecks in deep water, even if they were imbedded in the mud bottom. Sonar has been used to find modern wrecks, from the Bismarck in the Atlantic Ocean to Israeli warships in the Mediterranean. It also was used to find ancient shipwrecks in deep water.

Deep-water wrecks are very different from those in shallow water. Wrecks in shallow water landed on the bottom at all angles. They also typically have been buffeted by tides and currents, disturbed by fishermen, or looted by earlier explorers. Ships that foundered in deep water sank far through the water to the sea bottom, turning upright as the shape of their hulls offered the least resistance to the water. The ships then sat on the bottom or sank into the mud bottom upright, as if at sea. The wood used in ship construction rotted or was eaten, leaving the cargo in place or laying it down in a kind of projection of the ship onto the sea floor.

Two such sunken ships date from the latter half of the eighth century BCE, and they provide the central evidence for this paper. This evidence will be supplemented by customs records a little later and from older coastal wrecks. I need at this point to acknowledge my debt to the marine archaeologists who have found and described these relics of the past, and to Professor Lawrence Stager of Harvard University who has guided me through the archaeological literature.

The two 8<sup>th</sup> century ships were found far from the shore on a line from the northern Sinai coast and the Nile delta. Ancient ships had their galleys in the rear, which indicates that the ships probably were going west toward Egypt. (This is only a probable determination since the ships may have been fleeing a storm when they foundered.) The ships might have been destined for the new Phoenician colony at Carthage, but their location and cargo suggest they were bound for Egypt. The ships can be identified as Phoenician and dated to the 8<sup>th</sup> century by the pottery that was on board.

The two ships were 14 - 14.5 meters long and 5.5 - 6 meters wide. Their wide berth, one-third of their length, marks them as cargo ships rather than the sleeker and faster warships of the time (Casson, 1991, 75-80). They are roughly the same size as a 13<sup>th</sup> century BCE shallow-water wreck. Each of the ships was full of amphoras, approximately 400 to a ship. Amphoras were the common container of the ancient world, like the plastic gallon jugs of the modern era. Amphoras were made in three parts, a cylinder about as long as a potter's forearm, a pointed bottom, and a top with a small opening. The shape seems odd to us, living in a world of flat surfaces. But amphoras were made to be packed into ships with sloping sides, in overlapping rows held in place by ropes through their small handles. They were stored on land in structures with dirt or sand floors into which the amphora bottoms could be sunk. They were not used much for overland transport.

The amphoras, surprisingly, are of roughly the same size. Eleven of them have been raised, and they average 18 liters capacity, ranging only from 16 to 20 liters. Their external dimensions were even more uniform. The presence of 400 virtually identical amphoras on each of these ships suggests strongly that some form of trade was under way

when these ships foundered. A computer-generated image of the shipwreck as it was found, showing the amphoras still in some sort of order on the sea floor, is shown in Figure 1. This picture was the first evidence I saw of this trade, and it stimulated me to write this paper.

These amphoras were made in Phoenicia, an identification that can be made definitively from the presence in the pottery of an algae found only in coastal deposits of what is now Lebanon. They were made in a shape found in sites around that area, a shape that was recognizable elsewhere as being from Phoenicia and quite possibly as a guarantee of the standardized volume of the amphoras. A few amphora “factories” consisting of several kilns have been found from this period, and it is likely that the amphoras in our ships came from one or two of them. Amphoras made in Phoenician style have been found in many Egyptian sites of slightly later dates, suggesting that these ships—or other ships if not these particular ones—could have been destined for Egypt (Maeir, 2002).

The amphoras originally contained wine. They of course were full of mud, not wine, when found. The unbaked stoppers on the amphoras had dissolved, and mud had scoured out the amphora interiors. The mud did not clean the amphoras completely, and we can see that they had been lined with pine pitch from a common conifer found at the time in the Mediterranean area. This resin lining had trapped tartaric acid, found in grapes and grape products, from the amphoras' contents.

The Phoenician hinterland produced wine, some of which was regarded highly in ancient sources. The wine would have been grown away from the coast and shipped overland to the Phoenician coast. It appears to have been carried in *dannu* vessels that

contained ten times as much as amphoras. Ezekial spoke of *danē yayin me'uzal*, which can be translated as “(large) containers of wine from Izalla,” an ancient town in modern Turkey (Ballard, Stager, et al., 2002).

Far earlier in time, the discovery of a 13<sup>th</sup> century BCE shipwreck off the coast of Turkey, the Uluburun wreck, “is yet another indicator of an eastern Mediterranean sea route for the east-west transport of copper, tin, and other raw materials during the Late Bronze Age (Pulak, 1998, 191).” This ship contained about 500 copper ingots, 150 jars containing glass beads, olives, and—mostly—what appears to be resin. The ship may have been transporting wine like the later ships, but this ship may have been simply transporting the resin as there is no tartaric acid in these amphoras. There also was a variety of glass beads, jewelry and ceramics. And there were some weapons: four short swords and several daggers, arrowheads and spearheads.

The shipwreck contained remains of three balances and almost 150 weights. Half the weights had been carefully finished in a variety of zoomorphic shapes. The weights are not marked to indicate their weight, but we presume that ancient merchants did not have to choose among the full set. They each probably had a few sets, whose weights were easily distinguished. Archaeologists, being without the cloth or leather pouches that originally contained the weights, have had to search for order among them. They hypothesized a base weight and looked to see if many weights were simple multiples or fractions of this weight. Assuming a standard unit of 9.3 grams, they found weights that appeared to range from simple fractions of this value up to 50 units. Not all weights fit into this scheme, and statistical analysis suggested that there were at least three different weight standards represented on this ship. The main standard, based on 9.3 grams,

“undoubtedly represents a *shekel* of the ‘Syrian’ standard, a standard that was based on the Egyptian *qedet* (Pulak, 2000, 259).” The second most frequently found group of weights was slightly lighter, about 8.3 grams, and corresponded to a Mesopotamian standard. A third group was even lighter, and there was a hint from a few weights of even a fourth group.

We have also from about this time a Theban tomb painting that shows the scene of Syrian ships arriving in Egypt. The scene records several ships, some in the process of discharging their cargo, ranging from amphoras to live bullocks. Near the ships are three stalls where Egyptian men and women are engaged in what appear to be sales. They have textile samples hanging with other possible goods below, and two men in separate booths are holding balance scales. The disposition of most of the cargo is unclear, as the surviving picture shows them being carried to a missing destination. Archaeologists therefore have interpreted the stalls as private enterprise set up to deal along the margins of trade. This painting clearly shows the presence of market transactions in interregional trade, but it leaves open the extent to which the trade was bought and sold, as opposed to being accepted as tribute or other obligation (Davies and Faulkner, 1947).

The Uluburun wreck and Egyptian painting reveal the existence of trade in the Bronze Age. There was an interruption in trade, or at least in our evidence for it, in the transition between the Bronze and Iron Ages in the 12<sup>th</sup> century BCE. Once stability returned, trade appears to have revived in old patterns, as shown by the two 8<sup>th</sup> century shipwrecks. The evidence from the wrecks can be augmented by an Aramaic palimpsest on papyrus (that is, papyrus written on more than once with the underwriting still visible) containing records of the inspection, registration and taxation of ships arriving in Egypt

for ten months of the 5<sup>th</sup>-century year, 475 BCE. The largest of the ships contained almost 1500 amphoras of wine, four times as much as the two 8<sup>th</sup> century BCE ships. (It was about the same size as Columbus' *Niña*.) Other ships also contained amphoras of wine, typically in larger numbers than in the earlier ships, as well as copper, tin and iron ingots. Phoenician ships as a whole brought over 6,000 amphoras of wine to Egypt in the fall of 475 BCE, indicating a large demand for northern wines in Egypt. This large volume of Egyptian wine imports in the 5<sup>th</sup> century strengthens the case for an Egyptian destination for the 8<sup>th</sup> century ships (Stager, nd).

### Economics

The first point to make is that there is abundant evidence of trade in bulk commodities even before the invention of coinage, much less of more sophisticated arrangements. This is powerful support for Heckscher's argument that regional differences made for trade. Water transportation was far cheaper than land transportation, as it would stay until the invention of the railroad after the Industrial Revolution. The Mediterranean Sea provided a route for long-distance transportation that was cheap enough to use for grain, oil and wine. Local advantages therefore made for interregional trade.

This trade required a lot of coordination. It cannot have been a solitary activity to engage in trade, for the simple matter that there needed to be suppliers and recipients. In addition, not all products were found or grown at seaside; they had to be brought to a port and transshipped to a boat. When they arrived, the goods probably had to be transported again to the location of consumption. As we have seen, containers were needed for liquid cargoes—and probably for solid ones as well. These containers had to be manufactured

and allocated to trade. The extent of this coordination can be surmised from the presence of hundreds of virtually identical amphoras in each ship. There must have been many groups involved in this trade: growers, land transporters, transshippers, amphora makers, ship operators, receivers, and consumers. There may have been middlemen in addition at several points. Coordination of all these far-flung and quite disparate people was a formidable task.

How was this coordination achieved? There are only a few models in the literature of ways to organize such complex interactions. Pryor (1977) provided a useful taxonomy. He distinguished between what he called exchanges and transfers. Exchanges are balanced transactions where goods or services are exchanged for other goods or services of equal value. This of course is the kind of behavior most often observed in markets. Transfers are one-way transactions where goods and services are given without a direct return. Grants, tributes, and taxes are all transfers. Pryor excluded “invisibles” from this accounting, so that taxes are considered to be transfers rather than an exchange of goods or money in order to purchase social order or military success.<sup>1</sup>

Pryor subdivided exchanges into those in which the ratio of goods or services exchanged can vary and those in which it cannot. The former may or may not involve money; the latter do not. He termed the former, market exchange; the latter, reciprocal exchange. The use of money is a good index of this distinction, as are changes in the exchange ratio over time. In the presence of money, of course, changes in exchange ratios are expressed as changes in prices. Pryor divided transfers into centric and non-

---

<sup>1</sup> This exclusion is necessary because one can always hypothesize an invisible gain that makes all transactions balanced. In that case, there is no way to discriminate between different forms of behavior.

centric ones. Centric transfers are between individuals in a society and “an institution or an individual carrying out a societal-wide role (Pryor, 1977, 34).”

Heckscher of course analyzed market exchanges, and we need to ask if the ships we have found were engaged in this kind of reciprocal activity. The evidence from the 8<sup>th</sup> century is ambiguous; the ships may have been going to Phoenician colonies or to Egypt. If the former, we have no way of knowing if they were transfers or exchanges. The presence of balances aboard the Uluburun wreck and in the Egyptian painting, however, indicates the prevalence of market activity. The key as always is how these artifacts were used. What were the ancient traders doing with their balances?

The archaeological evidence indicates that they were comparing the weights of materials to some standard. In other words, they were dividing whatever was being weighed into units of a standard, identified by Pulak as a *shekel*. We normally speak of a standard of value as money, although we ask that any putative money have more than this single attribute. The other functions of money are as a means of transaction and a store of value. There is no indication that the weights found in the Uluburun shipwreck were traded, and we must look elsewhere for money performing these other functions.

Related evidence suggests that silver was used for transactions and as a store of value, divided into *shekel* units. There were no coins as yet, and it was the weight of silver that determined the value of a transaction. Numerous written examples point to the use of silver for transactions. We do not find loose silver, perhaps because it dissipates in the water, but we do find what is called *Hacksilber*: cut-up silver jewelry, ingots, or figurines that appears to have been stored in fabric pouches. These jewelry fragments could not have functioned as coinage, but they easily could have functioned as silver in

larger units than loose silver. If so, they probably were both means of exchange and stores of value. While we cannot infer that all trades across the Mediterranean in Biblical times were exchanges, we can confidently assert that some of it—perhaps most of it—was market exchange.

Heckscher phrased his proposition in terms of relative prices. We do not observe prices until the end of this period, but there was knowledge of relative scarcities even if people did not convert them into prices. And when we do have records that appear to be prices at the end of this period, they have the characteristics of modern prices. For example, Slotsky (1997) recorded what appeared to be a series of monthly market prices for six agricultural commodities for 400 years in ancient Babylon, starting in the 5<sup>th</sup> century BCE. They appeared to provide much more evidence of ancient market activity than had been available earlier, and Slotsky argued that her observations were market prices. I conducted an econometric analysis of these prices and confirmed that they indeed were market prices; they moved with a great deal of randomness, and they varied over time. More precisely, the Babylonian agricultural prices moved like the random walk of modern prices, and they varied together in response to exogenous events that affected all crops. These changes are clearly understood within a market framework; they are impossible to understand within an administrative one. I concluded therefore that the scribes recorded prices set in functioning markets, that is, they were examples of what Pryor called market exchanges (Temin, 2002).

I infer from this mixture of evidence from different times and places that much of the Mediterranean trade of the Biblical Era was exchange, coordinated by market activities; it was market exchange. If so, then the trade was in response to the forces

analyzed by Heckscher, a response to differing comparative advantage around the Mediterranean basin. Given the technology of the time, wine could not be produced in North Africa. It was imported from more northern localities. Egypt exported wheat as shown by the description of the traders of Sidon in Phoenicia in Isaiah (23:2-3); they imported grain from Shihor (Lower Egypt), which was “the harvest of the Nile.” It had been the reliable result of the annual flooding of the Nile since the times of Joseph and his brothers and would remain so into Roman times. Egypt also exported natron, a form of sodium carbonate used to make glass, bleach textiles and treat sick people, that was found in the Nile delta, but not on the northern shores of the Mediterranean. Even if these products were not all the object of market exchanges, they all were articles of reciprocal trade.

Heckscher talked of relative factor scarcities as well as relative scarcity of goods. It is even harder to find evidence of returns to factors than of product prices in this era, but we can at least pose the question. It is likely that land was the scarce factor in Egypt, since the agricultural area was limited to the flooding of the Nile. If trade was the result of differing factor proportions rather than different climates, it must have been the case that wheat was a labor-intensive commodity, while wine was a land-intensive one. In Phoenicia, trade raised the relative price of wine and therefore, if the assumption of relative factor proportions is correct, the return to land. The opposite effect in Egypt may well not have been relevant since Egypt was specialized in wheat production. Phoenician landowners may have been the primary gainers from trade as well as its apparent instigators.

These gains, however, were offset in part by increased risks. Three kinds of risks can be identified. There was the risk of natural disaster along the way, of the ship sinking or getting lost. There also was a risk of man-made trouble in the form of attack by pirates along the way or hostile people when the ship landed. And there was the risk of not being paid, or not paid what was due, by the recipients of the cargo. I discuss them in turn.

While it certainly was bad for ancient sailors and traders that sailing was hazardous in the ancient world, we are the beneficiaries. If we did not find ships at the bottom of the sea, we would have only a few clues to the existence of ancient trade. We cannot know if the risk changed over time. Archaeologists and ancient historians have tended to assume that the risk of shipwreck stayed constant; they have used the frequency of wrecks as an index of the volume of trade (Hopkins, 1980).

Ancient mariners were conscious of these risks, and they took actions to minimize them. They did not sail, or not often, in the winter. The port records in Egypt showed that ships vanished only in January and February, a short winter even for the Mediterranean. Roman shipping at a later date stopped for a longer period in the winter (Duncan-Jones, 1990, Chapter 1). It was thought earlier that sailors also reduced the risk of loss by staying close to shore. We now know that some ship captains were willing to brave the open seas. Given the primitive tools for navigation available at the time, they probably were not willing to make voyages for very long out of the sight of land. Hence the importance of trade along the hypotenuse of a triangle at the corner of the Mediterranean or across the strait opposite Carthage. These probably were the deep-water shipping lanes of the Biblical Era (Ballard, McCann, et al., 2000).

The risk of capture was quite different, but even harder to recover at this late date. A time when governments had limited jurisdiction and no single empire ruled the Mediterranean must have been a time when pirates abounded. Yet the ships that we have found in deep water do not appear to have been fortified. There are three possibilities: either the arms were so small as to be invisible in the wreckage, or they simply have been lost, or there were no pirates to fear. There were some weapons aboard the Uluburun wreck, but they do not seem enough to repel pirates. There also is evidence of warships, leaner and faster than the merchant ships I have described, that would provide another defense against pirates. Two ships containing 800 amphoras of wine between them must have been very tempting to a potential pirate.

Or was it? Casson (1991, 178) asserted that ancient pirates sought people rather than goods. It may have been hard for a pirate to sell 800 amphoras of Phoenician wine without the guarantee of both quantity and quality that came from Phoenician merchants. However poor people could be sold as slaves; rich people, held for ransom. The incentives can be illustrated by a story from the years just before the Romans cleared the Mediterranean of pirates. Pirates captured the young Julius Caesar on a voyage in the eastern Mediterranean. They sought and received a large ransom, made larger by Caesar's boast that he was worth more than their original request. However Caesar, once free, hired ships and soldiers and returned to capture the pirates. He recovered his ransom and crucified the pirates, as he had threatened while still their captive (Plutarch, *Caesar*, 1-2).

This story suggests a small theory of ancient piracy. Pirates wanted to find rich and powerful people at risk, because they could earn more from ransom than from the

sale of captives as slaves. Human capital was worth more to the relatives and colleagues of captives than to strangers who might purchase slaves. This relation was not monotonic, however. Capturing someone who was exceedingly rich or powerful was potentially dangerous as well as profitable, as the story about Caesar illustrates. There must have been an optimum wealth for ancient pirates to aim for, quite possibly one that shifted over time.

The existence of pirates in earlier times can be inferred from the political record. The break between trade in the Bronze and Iron Ages noted earlier was due to the invasion of the “Sea Peoples.” This invasion appears in the literature as a political operation, but it had an important economic dimension as well. Much later, Northmen invaded England and France in the 9<sup>th</sup> century CE, starting with piracy and marauding and progressing to settlement (Bloch, 1961). The earlier invasion, about which we know far less, undoubtedly exhibited the same progression. The heightened risk of piracy provides a good explanation for the dearth of Mediterranean trade in the 12<sup>th</sup> century BCE (Sherratt and Sherratt, 1993, 366).

Assuming the ship arrived safely to its intended port, there also was the risk of confiscation or commercial double-dealing. There were no international treaties or World Trade Organization to monitor these transactions. There must have been less formal arrangements that shippers could count on enough to launch two ships containing 400 amphoras of wine each into the Mediterranean. The most obvious of these arrangements is a reputation equilibrium, that is, an arrangement where people receiving shipments deal fairly with importers and are known to do so. They maintain this

behavior in order to encourage trade, foregoing the obvious short-term gain from confiscated a new cargo.

This organization was used in Bronze-Age Assyrian overland trade, where family firms prospered by sending out sons and other relatives to make the actual sales (Larsen, 1976, 92-105). Almost three millennia later, the Maghrebi traders of Alexandria had a highly developed form of reputation equilibrium. They sent associates, typically family members and almost exclusively fellow Jews, around the Mediterranean to conduct repeated transactions. They expected their agents to deal honestly with them, but they did not rely solely on this expectation to do business. If an agent cheated, the injured trader shared this information widely with his colleagues. The resulting loss of reputation was reflected immediately in a loss of employment. An agent who cheated then had the prospect of losing not only his present employment, which he would have lost when he cheated in any case, but also any future employment as a trading agent with the Maghrebi traders. The agent would not cheat under any reasonable circumstance, since the anticipated cost of doing so would be far larger than the gain he could get from pocketing the results of a single voyage (Greif, 1994).<sup>2</sup>

These motives were in force also in the early Iron Age, but they were not totally compelling. The Israelite prophets noted the use of false balances and dishonest scales among the other evils of their contemporaries (Amos 8:6; Hosea 12:8). In modern parlance, the transaction costs of international trade in the Biblical Era were very high. We presume that the gains from trade were even higher, which is why traders found it

---

<sup>2</sup> Larsen referred to the Medieval traders in explaining his views on Assyrian trade, albeit to authors who predated Greif.

worthwhile to ship even bulk commodities like wine and wheat across the sea in normal times.

After trade revived in the Iron Age, in the 8<sup>th</sup> century, traders and Israelite kings appear to have made efforts to reduce transaction costs in trade. They appear to have done this in a variety of ways. Traders began to label their weights with the units in *shekelim* that the weights represented. This enabled their transactions to be monitored more easily. The Israelite kings introduced jars labeled *lemelek*, meaning “of the king,” which probably functioned as guarantors of the standardized volume of the jars. Of course, if the king owned the contents of the jars as well as the jars themselves, then the thousands of *lemelek* inscriptions indicate centric transfers rather than market exchanges. The reforms of Hezekiah (8<sup>th</sup> century) and Josiah (7<sup>th</sup> century), which have been celebrated for their religious aspect, appear also to have contained attempts, which evidently had to be repeated, to standardize weights and measures (King and Stager, 2002, 312-14). All of these actions must have reduced transaction costs by increasing standardization and verifiability. They encouraged international trade and market exchanges—if they did not indicate the growth of a centralized state with centric transfers.

Prevailing archaeological thought supports the existence of markets rather than a centralized state. Larsen (1987, 54) described “a highly interactive world in which it is possible to follow commodities flowing from one end to the other” in the Middle Bronze Age. The Bronze-Age trade was organized as a mixture of controlled flows directed by central authorities and commercial transactions, but it was primarily limited to overland trade east of the Mediterranean. Liverani (1987) described the shift from the Bronze Age

to the Iron Age as a shift from centralized empires to trading city-states, from a pattern of gift-exchanges to profit-oriented commercial activity. (In Pryor's terminology, the shift was from reciprocal to market exchange.) Sherratt and Sherratt (1993, 362) agreed, stating that, "merchant enterprise, rather than state-controlled exchange, became the dominant mode of trading activity" of Mediterranean trade in Biblical times. Archaeologists, however, have focused primarily on trade in luxury goods, perhaps because they find evidence of them in archaeological sites. The point I want to make here is that transport and transaction costs fell enough by the Iron Age to create incentives for extensive international trade in bulk commodities.

A vivid window into transaction costs is given by the account of Wen-Amon's trip from Egypt to Phoenicia around 1050 BCE. This was about fifty years after the troubled time when the "Sea Peoples" destroyed the established networks of trade; the "Sea Peoples" in the Levant had changed from raiders to traders. Wen-Amon tells the story in the first person, and we presume that he was able to complete his journey, even though the surviving narrative is incomplete. We do not know if he wrote this account because it was typical or atypical; in the absence of other accounts, we take it as the former.

Wen-Amon went to Phoenicia to buy cedars of Lebanon for use in the Temple of Amon at Karnak. We know Wen-Amon went to buy the cedars because he brought silver with him to pay for them. And when he said to his host that his host should do as his father and grandfather had done in supplying cedars, his host responded that he would do so—as long as Wen-Amon gave him something in return. This was a market exchange,

not a centric transfer. The story's context suggests strongly that the seller expected silver. The historical context was the breakdown of the Egyptian state.

But the sale was not completed quickly. Wen-Amon took with him about a kilogram of silver and some gold. However, all this money was stolen as soon as he reached Dor, a port on the eastern shore of the Mediterranean occupied by one of the "Sea Peoples" called the Sikkel, located between the Phoenicians to the north and the Philistines to the south. The Sikkel had been pirates before they were traders, illustrating the transition described earlier (Stager, 1995, 337). It therefore should not be surprising that Wen-Amon's appeal for restitution was denied. Archeologists recently have unearthed a jar containing 17 linen bags of silver, each weighing half a kilogram, in Dor from about the time of Wen-Amon's voyage (Stern, 1998). Could this jar have been the eventual destination of his silver?

Finding himself in a tough place, Wen-Amon stole a comparable amount of silver from another ship and, apparently, used it in place of his own. Negotiations for the cedars dragged on for a long time with lots of histrionic speeches. It took months if not years to make the purchase and arrange for the cedars to be shipped to Egypt. When Wen-Amon started back to Egypt, he was shipwrecked in a storm in hostile territory. He persuaded his captors not to kill him, and the narrative breaks off (Pritchard, 1955, 25-29).

Three lessons emerge from this colorful tale of commerce in difficult times. The first is how hard it was to conduct international trade when the world was composed of many small political entities. The second is that international trade in quite heavy commodities took place despite these large transaction costs. And the third is that the

reforms of the 8<sup>th</sup> and 7<sup>th</sup> centuries are easily understood as attempts to reduce these enormous transaction costs.

### **Conclusions**

This paper bridges two disciplines. I hope that it indicates how economics can inform archaeology, framing questions and focusing the search for evidence. More relevant for this conference, this paper shows that the forces leading to international trade are very old. We know that trade in luxury goods and special items existed since time immemorial; the added information here is that trade in bulk commodities was present in the early Iron Age if not even earlier. I have argued here that this trade conforms to the patterns analyzed by Heckscher that have become staple items in the analysis of more recent trade. One does not need to have modern ships or communication technology or even coinage to engage in extensive international trade. It is unlikely that there was anything like factor price equalization in the Iron Age, but I have argued that there were tendencies in that direction.

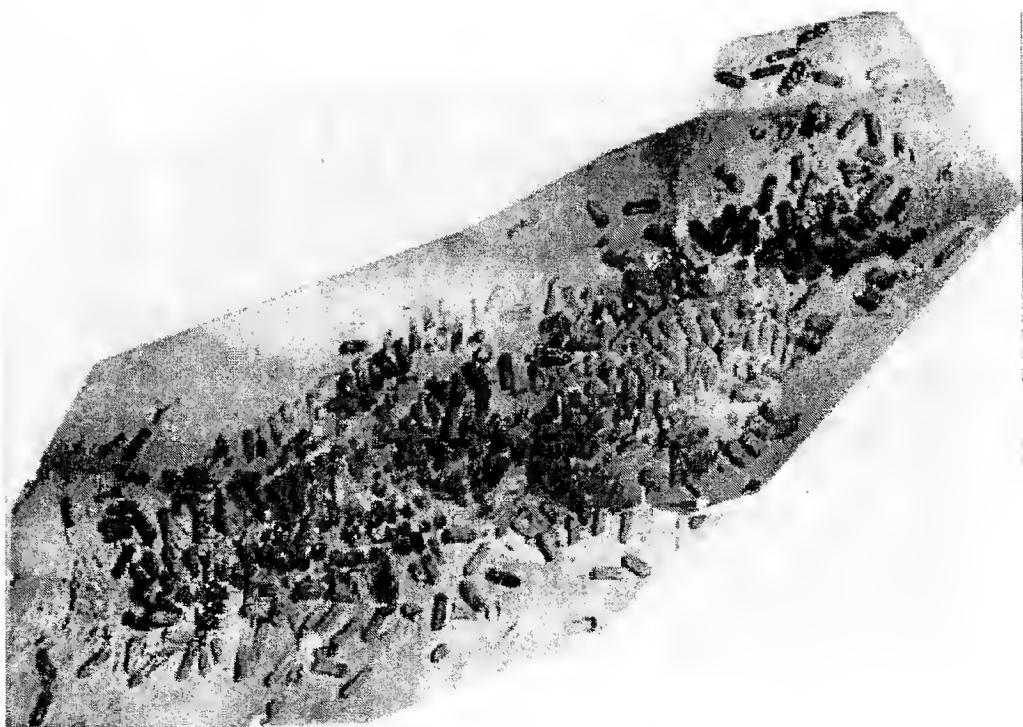


Figure 1

An 8<sup>th</sup> Century BCE Shipwreck as it “Appears” Today

Source: Ballard, Stager, et al., 2002, 154.

## References

Ballard, Robert D., Lawrence E. Stager, et al., "Iron Age Shipwrecks in Deep Water off Ashkelon, Israel," *American Journal of Archaeology*, 106 (2002), 151-68.

Ballard, Robert D., A. M. McCann, et al., "The Discovery of Ancient History in the Deep Sea using Advanced Deep Submergence Technology," *Deep-Sea Research*, 47 (2000), 1591-1620.

Bloch, Marc, *Feudal Society* (London: Routledge and Kegan Paul, 1961).

Casson, Lionel, *The Ancient Mariners* (Princeton: Princeton University Press, 1991).

Davies, Norman de G., and R. O. Faulkner, "A Syrian Trading Venture to Egypt," *Journal of Egyptian Archaeology*, 33 (December 1947), 40-46.

Duncan-Jones, Richard, *Structure and Scale in the Roman Economy* (Cambridge: Cambridge University Press, 1990).

Greif, Avner, "Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies," *Journal of Political Economy*, 102 (October 1994), 912-50.

Heckscher, Eli F., and Bertil Ohlin, *Heckscher-Ohlin Trade Theory*, translated, edited, and introduced by Harry Flam and M. June Flanders (Cambridge, MA: MIT Press, 1991).

Hopkins, Keith, "Taxes and Trade in the Roman Empire (200 B.C.-A.D. 400)," *Journal of Roman Studies* 70: 101-125 (1980).

King, Philip J. and Lawrence E. Stager, *Life in Biblical Israel* (Louisville, KY: Westminster and John Knox, 2001).

Larsen, Mogens T., *The Old Assyrian City-State and Its Colonies* (Copenhagen: Akademisk Forlag, 1976).

Larsen Mogens T., “Commercial Networks in the Ancient Near East,” in Michael Rowlands, Mogens Larsen and Kristian Kristiansen (eds.), *Centre and Periphery in the Ancient World* (Cambridge: Cambridge University Press, 1987), pp. 47-65.

Liverani, Mario, “The Collapse of the Near Eastern Regional System at the End of the Bronze Age: The Case of Syria,” in Michael Rowlands, Mogens Larsen and Kristian Kristiansen (eds.), *Centre and Periphery in the Ancient World* (Cambridge: Cambridge University Press, 1987), pp. 66-73.

Maeir, Aren M., “The Relations between Egypt and the Southern Levant during the Late Iron Age: The Material Evidence from Egypt,” *Ägypten und Levante*, 12 (2002), 235-46.

Pritchard, James B., *Ancient Near East Texts Relating to the Old Testament*, 2<sup>nd</sup> ed. (Princeton: Princeton University Press, 1955).

Pulak, Cemal, “The Uluburun Shipwreck: An Overview,” *International Journal of Nautical Archaeology*, 27 (1998), 188-224.

Pulak, Cemal, “The Balance Weights from the Late Bronze Age Shipwreck at Uluburun,” in C. F. E. Pare (ed.), *Metals Make the World Go Round: The Supply and Circulation of Metals in Bronze Age Europe* (Oxford: Oxbow, 2000), pp. 247-66.

Pryor, Frederic L., *The Origins of the Economy: A Comparative Study of Distribution in Primitive and Peasant Economies* (New York: Academic Press, 1977).

Sherratt, Susan and Andrew, “The Growth of the Mediterranean Economy in the Early First Millennium BC,” *World Archaeology*, 24 (February 1993), 361-78.

Slotsky, Alice Louise, *The Bourse of Babylon: Market Quotations in the Astronomical Diaries of Babylonia* (Bethesda, MD: CDL Press, 1997).

Stager, Lawrence E., “The Impact of the Sea Peoples (1185-1050 BCE),” in Thomas E. Levy (ed.), *The Archaeology of Society in the Holy Land* (London: Leicester University Press, 1995), Chapter 20.

Stager, Lawrence E., “Phoenician Shipwrecks and Tyre, Ship of State,” typescript, nd.

Stern, Ephraim, “Buried Treasure: The Silver Hoard from Dor,” *Biblical Archaeology Review*, 24 (July/August, 1998), 46-62.

Temin, Peter, “Price Behavior in Ancient Babylon,” *Explorations in Economic History*, 39 (January 2002), 46-60.

3241 704



AUG 26 2003  
Date Due

Lib-26-67

MIT LIBRARIES

DUPL



3 9080 02524 4192

